

Hydrological variations in Australia recovered by GRACE high-resolution mascons solutions.

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Australia represents a challenging region in which to study hydrological variations as recovered by the GRACE (Gravity Recovery And Climate Experiment) mission data. Much of Australia is characterized by relatively small hydrological signals, with large precipitation gradients between the North and the South. These signals are better recovered using innovative GRACE processing techniques such as high-resolution mascon solutions, which may help overcome the deficiencies in the standard GRACE data processing and filtering methods. We will show the power of using regional and global mascon solutions to recover hydrological variations from 2003 to 2011, as well as the oceanic mass variations in the surrounding regions. We will compare the GRACE signals with state of the art hydrology and ocean general circulation models, precipitation, soil moisture and groundwater data sets. We especially emphasize the gravity signatures observed during the decadal drought in the Murray-Darling river basin and the early 2011 floods in North-Western Australia.